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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/579,536

Applicant(s)

MARIONI ET AL.

Examiner

TANYA NGO

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-30 and 32-35 is/are rejected.
- 7) ☒ Claim(s) 31 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 6/16/2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Claim Objections

1. Claim 31 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claim 31 has not been further treated on the merits.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 32 and 34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant claims a "method of making" but does not disclose anywhere in the specification the steps of "providing an optical telescope", "providing a transmitter unit", "providing a receiver unit" and "providing a beacon detector".

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 6 recites the limitation "the first mirror" in the second line of claim 6. There is insufficient antecedent basis for this limitation in the claim. For the action, the examiner is interpreting claim 6 to be dependent on claim 3, which mentions the first mirror.

5. Claim 13 recites the limitation "wherein the first predetermined frequency" in lines 1-2 of claim 13. There is insufficient antecedent basis for this limitation in the claim. For the action, the examiner is interpreting claim 13 to be dependent upon claim 12.

6. Claim 14 recites the limitation "said first predetermined frequency" in 3 line of claim 14. There is insufficient antecedent basis for this limitation in the claim. For the action, examiner is interpreting claim 14 to be dependent on claim 13.

7. Claim 17 recites the limitation "the first mirror" in the second line of claim 17. There is insufficient antecedent basis for this limitation in the claim. For the action, the examiner is going to treat the rejection as if there were a first mirror in claim 16.

8. Claim 26 recites the limitation "said beamsplitter" in the second line of claim 26. There is insufficient antecedent basis for this limitation in the claim. For the action, the examiner is interpreting claim 26 to be dependent upon claim 25, which discloses a beam splitter.

9. Claim 27 recites the limitation "said second focusing lens" in the second line of claim 27. There is insufficient antecedent basis for this limitation in the claim. For the action, the examiner is interpreting claim 27 to be dependent upon claim 26 because it discloses a second focusing lens.

10. Claim 28 recites the limitation "the first predetermined frequency" in the first and second line of claim 28. There is insufficient antecedent basis for this limitation in the claim. For the action, the examiner is interpreting the claim to be dependent upon claim 27, which discloses a first predetermined frequency.

11. Claim 29 recites the limitation "said first predetermined frequency" in the third line of claim 29. There is insufficient antecedent basis for this limitation in the claim. For the action, the examiner is interpreting claim 29 to be dependent upon claim 27, which discloses a first predetermined frequency.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 16, 19, and 34-35 are rejected under 35 U.S.C. 102(a) as being anticipated by Britz US PG PUB 2004/0202474 A1.

Re claim 16, Britz discloses an optical communications terminal, comprising:
an optical telescope (58, Fig.3, *optical telescope*);
a transmitter unit coupled to source of optical signals (50, Fig. 3, *transmitter*);
a receiver unit for receiving optical signals (60, Fig. 3, *receiver*);
an optical system defining a transmit optical path between the optical telescope and the transmitter unit (*the transmitter includes a transmitter 2 and 54, which input their signals into the optical combiner 56 which continues on to the optical telescope, paragraph [0026], which is a defined path in the transmitter*), and defining a receive optical path between the optical telescope and the transmitter unit (*Fig. 3 discloses a free space optical channel as in link 30 of*

Fig. 1, paragraph [0026] which is bidirectional link paragraph [0020]. Therefore, the transmit path between the optical telescope and the transmitter is bidirectional and can further be defined as a receive path); and

characterized in that the transmitter unit comprises a plurality of transmitters (transmitter 50, Fig.3 comprises of a first and second optical transmitter, 52 and 54, paragraph [0026]), each transmitter being coupled to a respective source of optical signals (each transmitter transmits the input signal on a different wavelength, paragraph [0026] therefore each transmitter is coupled to a specific wavelength or source of optical signals).

Re claim 19, Britz discloses all the elements of claim 16, which claim 19 is dependent on. Furthermore, Britz discloses each transmitter is fed by the same optical signal (transmitter 52 and 54 have the same input signal, Fig. 3).

Re claim 34, Britz discloses a method of making an optical communications terminal, comprising:

- providing an optical telescope;
- providing a transmitter unit coupled to source of optical signals;
- providing a receiver unit for receiving optical signals;
- providing an optical system defining a transmit optical path between the optical telescope and the transmitter unit, and defining a receive optical path between the optical telescope and the transmitter unit; and

characterized in that the transmitter unit comprises a plurality of transmitters, each transmitter being coupled to a respective source of optical signals (*See rejection to claim 16.*

Claim 16 rejects all the components present in claim 34 and there presences in the rejection of claim 1 means that they are inherently provided to the user).

Re claim 35, apply the rejection upon claim 16 to those components which claim 35 discloses that are identical to claim 16. Furthermore, Claim 35 discloses said method comprising receiving optical signals in said receiver unit (*Britz further discloses receiving optical signals through an optical telescope, paragraph [0010]*).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claim 1-2, 5, 7-8, 22-23, and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Britz US PG PUB 2004/0202474 A1 and Dishman et al (herein Dishman US Patent 6, 271,953 B1.

Re claim 1, Britz discloses an optical communications terminal , comprising:
an optical telescope (*88, Fig. 2, optical telescope*);
a transmitter unit (*80, Fig. 2, transmitter*) including at least one transmitter coupled to source of optical signals (*optical transmitter is a laser diode or other electro-optic devices, paragraph [0026]*);
a receiver unit for receiving optical signals (*90, Fig. 2, receiver*);

an optical system defining a transmit optical path between the optical telescope and the transmitter unit (*drive laser transmitter 82 is input into optical amplifier 84 to couple an optical signal through fiber connection 86 to optical telescope 88, paragraph [0023], which is a defined path for the transmitted signal to take in the transmitter*), and defining a receive optical path between the optical telescope and the receiver unit (*optical telescope 91 has a defined optical path to the optical detector 97, Fig. 2, paragraph [0024], which is a defined path for the received signals to take in the receiver*); and

Britz does not appear to explicitly disclose a beacon detector for detection beacon optical signals received at the optical telescope and a beacon optical path between the optical telescope and the beacon detector comprises at least a portion of said transmit optical path and/or said receive optical path. However, Dishman discloses a special telescope point tracking beacon components 106 are used for optically establishing and maintaining optical alignment between two platforms (*Col. 8, lines 61-64*). Furthermore, the beacon detecting components should includes a pointing and tracking detector detecting the pointing and tracking beacon (*Abstract*). Britz and Dishman are analogous art because they are from the same field of endeavor, optical free space communications. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz and Dishman before him or her, to modify the optical telescopes of Britz to include the special telescope pointing tracking beacon components of Dishman because the allow for optical establishing and maintaining optical alignment between two platforms (*Col. 8, lines 61-64*). Naturally flowing from this combination, the beacon detector will detect beacon optical

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signal received at the optical telescope, and will be in the transmit optical path because it is in the telescope, which is part of the transmit path.

Re claim 2, Britz and Dishman disclose all the elements of claim 1, which claim 2 is dependent upon. Furthermore, Britz and Dishman discloses the transmitter unit, receiver unit and beacon detector are disposed at or adjacent the focal plane of the optical telescope *(The transmitter unit 80 is adjacent to the focal plane of the emitting telescope 88 via the optical fiber, paragraph [0024], Fig. 2, and to the extent that it is not shown in Fig. 2, it is inherent because the transmitter would have to be adjacent to the focal plane of the emitting telescope 88 in order to transmit any optical signal. Furthermore, the detector 97 is adjacent to the collecting telescope 91, Fig. 2 which is ensure by optical fiber 94, paragraph [0024], and to the extent that it is not shown in Fig. 2, it is inherent because the receiver would have to be adjacent to the focal plane of the optical telescope 91 in order to receive any optical signal. Lastly, the beacon detector is disposed at the focal plane of the optical telescope because it is in the optical telescope, according to the prior combination, and also detects the beacon signal, therefore rendering it adjacent to the focal plane).*

Re claim 5, Britz and Dishman disclose all the elements claim 1, which claim 5 is dependent upon. Furthermore Britz discloses in an different embodiment wherein the transmitter unit includes a plurality of transmitters *(transmitter 50, Fig.3 comprises of a first and second optical transmitter, 52 and 54, paragraph [0026])*. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz before him or her, to modify the free space communication system of the first embodiment

(Fig. 2) to include the multiplex laser transmitters of the second embodiment (Fig. 3) because the transmitter can convert the input signal into redundant optical signals at different wavelengths before optical sending two beams to the receiver, paragraph [0028], so that the receiver can use both signals to optimally combine the signal, paragraph [0029], such that one could optimally receive them.

Re claim 7, Britz and Dishman disclose all the elements claim 1, which claim 7 is dependent upon. Furthermore, Britz discloses one transmitter comprises the terminating portion of a single mode optical fiber (*the laser transmitter 82 inputs an optical signals to the amplifier via an single mode optical fiber 86, which terminates at the emitting telescope because the optical telescope propagates the optical signal via free space*). Britz does not appear to explicitly disclose a collimating lens preferably being provided at said terminating portion in a respective transmit optical path. However, Britz discloses *the transmit telescope includes a optical 128 which focuses the optical signal, paragraph [0030]*. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz before him or her, to modify the transmitter and receiver of Britz to include the WDM transmitters of Fig. 5 because this arrangement of optical transmitter is able to tolerate deep fades that last for tens of milliseconds (*paragraph [0030]*).

Re claim 8, Britz and Dishman disclose all the elements of claim 5, which claim 8 is dependent upon. Furthermore, Britz discloses each transmitter is fed by the same optical signal (*transmitter 52 and 54 are fed by the same signal, but output different wavelengths*).

Re claim 22, Britz discloses all the elements of claim 16, which claim 22 is dependent upon. Britz does not disclose in this embodiment a beacon detector for detecting beacon optical signals received at the optical telescope. However, Dishman discloses a special telescope point tracking beacon components 106 are used for optically establishing and maintaining optical alignment between two platforms (*Col. 8, lines 61-64*). Furthermore, the beacon detecting components should includes a pointing and tracking detector detecting the pointing and tracking beacon (*Abstract*). Britz and Dishman are analogous art because they are from the same field of endeavor, optical free space communications. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz and Dishman before him or her, to modify the optical telescopes of Britz to include the special telescope pointing tracking beacon components of Dishman because the allow for optical establishing and maintaining optical alignment between two platforms (*Col. 8, lines 61-64*).

Re claim 23, Britz and Dishman disclose all the elements of claim 22, which claim 23 is dependent upon. Furthermore, Britz and Dishman discloses the transmitter unit, receiver unit and beacon detector are disposed at or adjacent the focal plane of the optical telescope (*The transmitter unit 80 is adjacent to the focal plane of the emitting telescope 88 via the optical fiber, paragraph [0024], Fig. 2, and to the extent that it is not shown in Fig. 2, it is inherent because the transmitter would have to be adjacent to the focal plane of the emitting telescope 88 in order to transmit any optical signal. Furthermore, the detector 97 is adjacent to the collecting telescope 91, Fig. 2 which is ensure by optical fiber 94, paragraph [0024], and to the extent that it*

is not shown in Fig. 2, it is inherent because the receiver would have to be adjacent to the focal plane of the optical telescope 91 in order to receive any optical signal. Lastly, the beacon detector is disposed at the focal plane of the optical telescope because it is in the optical telescope, according to the prior combination, and also detects the beacon signal, therefore rendering it adjacent to the focal plane).

Re claim 32, Britz and Dishman disclose a method of making an optical communications terminal, comprising:

- providing an optical telescope;
- providing a transmitter unit including at least one transmitter coupled to source of optical signals;
- providing a receiver unit for receiving optical signals;
- providing an optical system defining a transmit optical path between the optical telescope and the transmitter unit, and defining a receive optical path between the optical telescope and the receiver unit; providing a beacon detector for detecting beacon optical signals received at the optical telescope; and

characterized in that a beacon optical path between the optical telescope and the beacon detector comprises at least a portion of said transmit optical path and/or said receive optical path. *(See rejection to claim 1. Claim 1 rejects all the present components in claim 32 and there presences in the rejection of claim 1 means that they are inherently provided to the user).*

Re claim 33, apply the rejection upon claim 1 to those components which claim 33 discloses that are identical to claim 1. Furthermore, Claim 33 discloses said method

comprising receiving optical signals in said receiver unit (*Britz further discloses receiving optical signals through an optical telescope, paragraph [0010]*).

16. Claim 3-4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Britz and Dishman as applied to claim 1 above, and further in view of Presby et al (herein Presby) US Patent 6,445,496.

Re claim 3, Britz and Dishman disclose all the elements of claim 1, which claim 3 is dependent upon. Britz and Dishman do not explicitly disclose the optical system includes a relay lens. However, Britz does disclose the transmit telescope has the optical signals being launched and focused by optical lens 128 onto another telescope, (*paragraph [0030], Fig. 4*). At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz before him or her, to modify the transmitter and receiver of Britz to include the WDM transmitters of Fig. 5 because this arrangement of optical transmitter is able to tolerate deep fades that last for tens of milliseconds (*paragraph [0030]*).

Furthermore, Britz and Dishman do not appear to explicitly disclose a first mirror, and the optical path between said first mirror and the optical telescope is common to the transmit optical path, the receive optical path and the beacon optical path. However, Presby discloses an Ritchey-Chretien (RC) telescope characterized with a concave primary mirror (*Col. 2, lines 27-35*). Britz and Presby are analogous art because they are from the same field of endeavor, free space optical communications. At the time of the invention, it would have

been obvious to one of ordinary skill in the art, having the teachings of Britz and Presby before him or her, to modify the optical telescopes of Britz to include the mirror configurations of Presby because the mirror configuration provides a larger focal plane that allows for automatic alignment between transmitter and receiver with a station of fixed mirror design, further contributing to a lower fabrication cost (*Abstract*). Naturally flowing from this combination, the first mirror, which is in the optical telescope, is common to the transmit optical path, the receive optical path, and the beacon optical path.

Re claim 4, Britz, Dishman, and Presby disclose all the elements of claim 3, which claim 4 is dependent upon. Furthermore, Dishman discloses the optical system includes a beamsplitter (145, Fig. 4) between the first mirror (*in the collecting telescope 144, Fig. 4, according to prior combination*) and the receiver unit (*detector 78a, Fig. 4*), the beamsplitter, in use, passing receiver optical signals along the transmit optical path to the receiver unit (*the optical splitter is coupled between telescope 144 so that receive optical signals may be processed with respect to the receiver 78a, Col. 9 line 63 - Col. 10, line 6*) and reflecting beacon optical signals along the beacon optical path to the beacon (*the optical splitter is coupled between telescope 144 so that detector 73 receives only the point and tracking beacon optical signals so may be processed by controller 130 and executed, Col. 9 line 63 - Col. 10, line 6*). At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz and Dishman before him or her, to modify the receiver of Britz to include the beam splitter of Dishman because it allows for the PAT signal as well as the optical communications signals to be received by their proper detectors so that they may be processed properly.

Re claim 6, Britz, Dishman, and Presby disclose all the elements of claim 3, which claim 6 is dependent upon. Furthermore, Presby discloses wherein for at least one of said at least one transmitter an aperture is provided in the first mirror (*hole 350, Fig. 3 in the RC telescope 300, further described in RC telescope 200, Fig. 2, hole 250, Col. 2, lines 41-54*), a separate transmit optical path thereby being provided from at least one of said at least one transmitter to the optical telescope via a respective aperture (*a nxn fiber array 350 is placed in the focal plane of the RC telescope after the hole or aperture, wherein the fiber array is focused on a different receiving optical telescope and therefore transmitting the optical energy over a distinct path. Therefore, separate optical transmit paths are provided for the transmitter to multiple receiving telescopes, Col. 5, lines 12-25*).

17. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Britz and Dishman as applied to claim 5 above, and further in view of Buckman et al (herein Buckman) US PG PUB 2004/0207926 A1.

Re claims 9, Britz discloses all the elements of claim 5, which claim 9 is dependent upon. Britz discloses a plurality of transmitters in the transmitter unit according to the rejection in claim 5 and 16. Britz does not appear to explicitly disclose wherein each transmitter is fed by a different optical signal. However, Buckman discloses a common WDM-based optical transmission system in which a plurality of transmitters 110 each having a different wavelength is fed from an array of data sources 112, which are not the same signal (*paragraph [0008], Fig. 1*) and that this WDM system is be carried out over free space

(*paragraph [0007]*). Britz and Buckman are analogous art because they are from the same field of endeavor, WDM free space optical communications. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz and Buckman before him or her, to modify the free space communication system of Britz to include the transmission of different signals on different wavelengths of Buckman because it is a common practice in the art and allows for one to multiple streams of data simultaneously.

Re claim 10, Britz discloses all the elements of claim 5, which claim 9 is dependent upon. Britz discloses a plurality of transmitters in the transmitter unit according to the rejection in claim 5 and 16. Britz does not appear to explicitly disclose wherein there are three transmitters. However, Buckman discloses a common WDM-based optical transmission system in which a three transmitters 110 (*paragraph [0008], Fig. 1*) and that this WDM system is be carried out over free space (*paragraph [0007]*). Britz and Buckman are analogous art because they are from the same field of endeavor, WDM free space optical communications. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz and Buckman before him or her, to modify the free space communication system of Britz to include the three transmitters on different wavelengths of Buckman because it is a common practice in the art and allows for one to multiple streams of data simultaneously.

18. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Britz, Dishman, and Presby as applied to claim 4 and 25 above, and further in view of Schuster et al (herein Schuster) US Patent 6,970,651 B1.

Re claim 11, Britz, Dishman, and Presby disclose all the elements of claim 4, which claim 11 is dependent upon. Britz, Dishman, and Presby do not disclose the beacon optical path includes a second focusing lens between said beamsplitter and the beacon detector. However, Schuster discloses including a secondary focusing lens prior to a tracking detector 60 (*Col. 8, lines 41-44*). Britz and Schuster are analogous art because they are from the same field of endeavor, free space optical communications. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz, Dishman and Schuster before him or her, to modify the optical system of Britz and Dishman to include the focusing lens of Schuster because it allows for the optical beam to be focused on the detectors prior to being detected, therefore, improve the reception of the signal.

19. Claim 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Britz, Dishman, Presby and Schuster as applied to claim 11 above, and further in view of Lee et al (herein Lee) US PG PUB 2002/0021511 A1

Re claim 12, Britz, Dishman, Presby and Schuster disclose all the elements of claim 11, which claim 12 is dependent upon. Britz, Dishman, Presby, and Schuster do not appear to explicitly disclose wherein the beacon optical path includes a filter system between said second focusing lens and the beam detector, the filter system preferably including, a filter

passing a first predetermined frequency. However, Dishman disclose a band pass filter 146b prior to the beacon detector 73 wherein the beacon is filtered and only the beacon is passed (*Fig. 4, Col 9 line 62 – Col. 10, line 6*). At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz, Dishman, Bjorndahl, Presby, and Schuster before him or her, to modify the receiver of Britz, Dishman, Bjorndahl, Presby, and Schuster to include the band pass filter of Dishman because it allows for only the beacon signal to be detected, removing any noise. Furthermore, the beacon is a predetermined frequency.

Furthermore, Britz, Dishman, Presby and Schuster disclose the second focusing lens. Britz and Presby do not appear to explicitly disclose wherein the beacon optical path includes a filter system between said second focusing lens and the beam detector, the filter system preferably including a neutral density filter. However, Lee discloses that it is common practice in the art to use various filters, including a ND filter, to vary to intensity distribution of the laser (*paragraph [0005] and [0006]*). Britz, Presby, and Lee are analogous art because they are from the same field of endeavor, communication systems using including a laser or optical beam. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz, Presby, and Lee before him or her, to modify the receive path, which includes ND filter of Lee prior to the detectors in the conic collector of Britz because the ND filter adjusts the whole intensity of the laser, therefore preventing damage to any optical devices and undesirable results from excessive laser energy (*paragraph [0006]*).

Re claim 13, Britz, Dishman, Presby, Schuster, and Lee disclose all the elements of claim 12, which claim 13 is dependent upon. Furthermore, it would be obvious for one of ordinary skill as a matter of design choice for an individual to have the first predetermined frequency as 830 nm in order to receive the signal traveling on said frequency.

Re claim 14, Britz, Dishman, Presby, Schuster, and Lee disclose all the elements of claim 13, which claim 14 is dependent upon. Furthermore, Dishman discloses wherein, the receiver unit includes one receiver (*78a, Fig. 4*) for receiving optical signals at a second predetermined frequency (*a band pass filter 146a filters out the communication signal to the communication detector, therefore only the communication signals are detected, Col 9 line 62 – Col. 10, line 6*), different to said first predetermined frequency (*frequency difference between the beacon signal and the communication signal are useful for filter the beacon from the communication signal, Col. 7, lines 4-6*). Furthermore, it would be obvious for one of ordinary skill as a matter of design choice for an individual to have the second predetermined frequency preferably be 1550 nm in order to receive the signal at the transmission frequencies, whatever the frequency may be.

Re claim 15, Britz, Dishman, Presby, Schuster, and Lee disclose all the elements of claim 14, which claim 15 is dependent upon. Furthermore, Britz does not appear to explicitly disclose the receiver comprises a terminating portion of a multimode optical fiber. However, Britz does disclose that the transmit telescope contains a coupler 124 that divides the combined WDM signal into two wavelengths, and they are recovered at the receiving telescope as a multimode signal, (*paragraph [0030]*). At the time of the invention, it would

have been obvious to one of ordinary skill in the art, having the teachings of Britz before him or her, to modify the transmitter and receiver of Britz to include the WDM transmitters of Fig. 5 because this arrangement of optical transmitter is able to tolerate deep fades that last for tens of milliseconds (*paragraph [0030]*). Naturally flowing from this combination, the received signal that is put into the fiber from the conical connector (*paragraph [0024]*) is a multimode signal, and would make the signal a multimode fiber.

20. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Britz as applied to claim 16 above, and further in view of Presby et al (herein Presby) US Patent 6,445,496.

Re claim 17, Britz discloses all the elements of claim 16, which claim 17 is dependent upon. Britz discloses the transmitting signals from the transmitters being sent to an optical telescope (*fig. 3*). Britz does not appear to explicitly disclose wherein for at least one of said plurality of transmitters an aperture is provided in the first mirror, a separate transmit optical path thereby being provided from said at least one of said plurality of transmitters to the optical telescope via a respective aperture. However, Presby discloses wherein for at least one of said at least one transmitter an aperture is provided in the first mirror (*hole 350, Fig. 3 in the RC telescope 300, further described in RC telescope 200, Fig. 2, hole 250, Col. 2, lines 41-54*), a separate transmit optical path thereby being provided from at least one of said at least one transmitter to the optical telescope via a respective aperture (*a nxn fiber array 350 is placed in the focal plane of the RC telescope after the hole or aperture, wherein the fiber array is*

focused on a different receiving optical telescope and therefore transmitting the optical energy over a distinct path. Therefore, separate optical transmit paths are provided for the transmitter to multiple receiving telescopes, Col. 5, lines 12-25). Britz and Presby are analogous art because they are from the same field of endeavor, free space optical communications. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz and Presby before him or her, to modify the optical telescopes of Britz to include the mirror configurations of Presby because the mirror configuration provides a larger focal plane that allows for automatic alignment between transmitter and receiver with a station of fixed mirror design, further contributing the a lower fabrication cost (*Abstract*).

21. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Britz as applied to claim 16 above, and further in view of Covey US Patent 4,919,506.

Re claim 18, Britz discloses all the elements of claim 16, which claim 18 is dependent upon. Britz does not explicitly disclose at least one of said plurality of transmitters comprises the terminating portion of a single mode optical fiber (*each transmitter 52 and 54 output there signal to an optical fiber to be sent to the optical combiner 56, Fig. 3. Since each fiber carries one ray of light from one transmitter, it is a single-mode optical fiber*), a collimating lens preferably being provided at said terminating portion in a respective transmit optical path (*the transmit telescope includes a optical 128 which focuses the optical signal, paragraph [0030]*).

To the extent that the fiber in the transmitter is not a single mode fiber, at the time of the invention, it would have been obvious to one of ordinary skill in the art, having the

teachings of Britz and Convey before him or her, to modify the transmitting unit of Britz to include the single mode fiber of Covey because the single-mode fiber eliminates or at least reduces velocity dispersion in the propagated light signal (*Col. 1, lines 14-17*).

22. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Britz as applied to claim 16 above, and further in view of Buckman et al (herein Buckman) US PG PUB 2004/0207926 A1.

Re claims 20, Britz discloses all the elements of claim 16, which claim 20 is dependent upon. Britz discloses a plurality of transmitters in the transmitter unit according to the rejection in claim 5 and 16. Britz does not appear to explicitly disclose wherein each transmitter is fed by a different optical signal. However, Buckman discloses a common WDM-based optical transmission system in which a plurality of transmitters 110 each having a different wavelength is fed from an array of data sources 112, which are not the same signal (*paragraph [0008], Fig. 1*) and that this WDM system is be carried out over free space (*paragraph [0007]*). Britz and Buckman are analogous art because they are from the same field of endeavor, WDM free space optical communications. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz and Buckman before him or her, to modify the free space communication system of Britz to include the transmission of different signals on different wavelengths of Buckman because it is a common practice in the art and allows for one to multiple streams of data simultaneously.

Re claim 21, Britz discloses all the elements of claim 16, which claim 20 is dependent upon. Britz discloses a plurality of transmitters in the transmitter unit according to the rejection in claim 5 and 16. Britz does not appear to explicitly disclose wherein there are three transmitters. However, Buckman discloses a common WDM-based optical transmission system in which a three transmitters 110 (*paragraph [0008], Fig. 1*) and that this WDM system is be carried out over free space (*paragraph [0007]*). Britz and Buckman are analogous art because they are from the same field of endeavor, WDM free space optical communications. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz and Buckman before him or her, to modify the free space communication system of Britz to include the three transmitters on different wavelengths of Buckman because it is a common practice in the art and allows for one to multiple streams of data simultaneously.

23. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Britz and Dishman as applied to claim 22 above, and further in view of Bjorndahl et al (herein Bjorndahl) US PG PUB 2005/0036789 A1 and Presby et al (herein Presby) US Patent 6,445,496.

Re claim 24, Britz and Dishman disclose all the elements claim 22, which claim 22 is dependent upon. Dishman following disclose the transmit telescope has the optical signals being launched and focused to a relay optical unit 144(*Fig. 2, Col. 9, lines 61-62*). However, Britz and Dishman do not explicitly disclose the optical system includes a relay lens.

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Bjorndahl discloses using a relay lens within the transmit path in order to further reduce dispersion in the optical signal or to provide a change of direction in the signal through optical diffraction (paragraph [0062]). Britz, Dishman, and Bjorndahl are analogous art because they are of the same field of endeavor, which is free space optical communication. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz, Dishman, and Bjorndahl before him or her, to modify the optical system of Britz and Dishman to include the relay lens of Bjorndahl because the relay lens further reduces dispersion (paragraph [0062] which improves the quality of transmission.

Furthermore, Britz does not appear to explicitly disclose a first mirror, and the optical path between said first mirror and the optical telescope is common to the transmit optical path, the receive optical path and the beacon optical path. However, Presby discloses an Ritchey-Chretien (RC) telescope characterized with a concave primary mirror (*Col.* 2, *lines* 27-35). Britz and Presby are analogous art because they are from the same field of endeavor, free space optical communications. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz and Presby before him or her, to modify the optical telescopes of Britz to include the mirror configurations of Presby because the mirror configuration provides a larger focal plane that allows for automatic alignment between transmitter and receiver with a station of fixed mirror design, further contributing to a lower fabrication cost (*Abstract*). Naturally flowing from this combination, the first mirror, which is in the optical telescope, is common to the

transmit optical path, the receive optical path (*Fig. 3*) and the beacon optical path (*from the combination in claim 22 rejection*).

Re claim 25, Britz, Dishman, Bjorndahl, and Presby disclose all the element of claim 24, which claim 25 is dependent upon. Furthermore, Dishman discloses the optical system includes a beamsplitter (*145, Fig. 4*) between the first mirror (*in the collecting telescope 144, Fig. 4, according to prior combination*) and the receiver unit (*detector 78a, Fig. 4*), the beamsplitter, in use, passing receiver optical signals along the transmit optical path to the receiver unit (*the optical splitter is coupled between telescope 144 so that receive optical signals may be processed with respect to the receiver 78a, Col. 9 line 63 - Col. 10, line 6*) and reflecting beacon optical signals along the beacon optical path to the beacon (*the optical splitter is coupled between telescope 144 so that detector 73 receives only the point and tracking beacon optical signals so may be processed by controller 130 and executed, Col. 9 line 63 - Col. 10, line 6*). At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz and Dishman before him or her, to modify the receiver of Britz to include the beam splitter of Dishman because it allows for the PAT signal as well as the optical communications signals to be received by their proper detectors so that they may be processed properly.

24. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Britz, Dishman, Presby, and Bjorndahl as applied to claim 24 above, and further in view of Schuster et al (herein Schuster) US Patent 6,970,651 B1.

Re claim 26, Britz, Dishman, Bjorndahl and Presby disclose all the elements of claim 25, which claim 26 is dependent upon. Britz, Dishman, and Bjorndahl and Presby do not disclose the beacon optical path includes a second focusing lens between said beamsplitter and the beacon detector. However, Schuster discloses including a secondary focusing lens prior to a tracking detector 60 (*Col. 8, lines 41-44*). Britz and Schuster are analogous art because they are from the same field of endeavor, free space optical communications. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz, Dishman and Schuster before him or her, to modify the optical system of Britz and Dishman to include the focusing lens of Schuster because it allows for the optical beam to be focused on the detectors prior to being detected, therefore, improve the reception of the signal.

25. Claims 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over , Britz, Dishman, Bjorndahl, Presby, and Schuster as applied to claim 26 above, and further in view of Lee et al (herein Lee) US PG PUB 2002/0021511 A1.

Re claim 27, Britz, Dishman, Bjorndahl, Presby, and Schuster disclose all the elements of claim 26, which claim 27 is dependent upon. Britz, Dishman, Bjorndahl, Presby, and Schuster do not appear to explicitly disclose wherein the beacon optical path includes a filter system between said second focusing lens and the beam detector, the filter system preferably including, a filter passing a first predetermined frequency. However, Dishman disclose a band pass filter 146b prior to the beacon detector 73 wherein the beacon is filtered

and only the beacon is passed (*Fig. 4, Col 9 line 62 – Col. 10, line 6*). At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz, Dishman, Bjorndahl, Presby, and Schuster before him or her, to modify the receiver of Britz, Dishman, Bjorndahl, Presby, and Schuster to include the band pass filter of Dishman because it allows for only the beacon signal to be detected, removing any noise. Furthermore, the beacon is a predetermined frequency.

Furthermore, Britz, Dishman, Bjorndahl, Presby, and Schuster disclose the second focusing lens. Britz, Dishman, Bjorndahl, Presby, and Schuster do not appear to explicitly disclose wherein the beacon optical path includes a filter system between said second focusing lens and the beam detector, the filter system preferably including a neutral density filter. However, Lee discloses that it is common practice in the art to use various filters, including a ND filter, to vary to intensity distribution of the laser (*paragraph [0005] and [0006]*). Britz, Presby, and Lee are analogous art because they are from the same field of endeavor, communication systems using including a laser or optical beam. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz, Presby, and Lee before him or her, to modify the receive path, which includes ND filter of Lee prior to the detectors in the conic collector of Britz because the ND filter adjusts the whole intensity of the laser, therefore preventing damage to any optical devices and undesirable results from excessive laser energy (*paragraph [0006]*).

Re claim 28, Britz, Dishman, Bjorndahl, Presby, Schuster and Lee disclose all the elements of claim 27, which claim 28 is dependent upon. Furthermore, it would be obvious

for one of ordinary skill as a matter of design choice for an individual to have the first predetermined frequency as 830 nm in order to receive the signal traveling on said frequency.

Re claim 29, Britz, Dishman, Bjorndahl, Presby, Schuster and Lee disclose all the elements of claim 27, which claim 29 is dependent upon. Furthermore, Dishman discloses wherein, the receiver unit includes one receiver (*78a, Fig. 4*) for receiving optical signals at a second predetermined frequency (*a band pass filter 146a filters out the communication signal to the communication detector, therefore only the communication signals are detected, Col 9 line 62 – Col. 10, line 6*), different to said first predetermined frequency (*frequency difference between the beacon signal and the communication signal are useful for filter the beacon from the communication signal, Col. 7, lines 4-6*). Furthermore, it would be obvious for one of ordinary skill as a matter of design choice for an individual to have the second predetermined frequency preferably be 1550 nm in order to receive the signal at the transmission frequencies, whatever the frequency may be.

Re claim 30, Britz, Dishman, Bjorndahl, Presby, Schuster and Lee disclose all the elements of claim 29, which claim 30 is dependent upon. Furthermore, Britz does not appear to explicitly disclose the receiver comprises a terminating portion of a multimode optical fiber. However, Britz does disclose that the transmit telescope contains a coupler 124 that divides the combined WDM signal into two wavelengths, and they are recovered at the receiving telescope as a multimode signal, (*paragraph [0030]*). At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Britz before him or her, to modify the transmitter and receiver of Britz to include the

WDM transmitters of Fig. 5 because this arrangement of optical transmitter is able to tolerate deep fades that last for tens of milliseconds (*paragraph [0030]*). Naturally flowing from this combination, the received signal that is put into the fiber from the optical telescope (*paragraph [0027]*) is a multimode signal, and would make the signal a multimode fiber.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TANYA NGO whose telephone number is (571) 270-7488. The examiner can normally be reached on M - F from 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngo/
Oct. 7, 2009

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